The role of industrial parks in ensuring sustainable development of the region

*Natalia Borodavkina**, and *Elena Mukovnina*

Immanuel Kant Baltic Federal University, Nevskogo str., 14, 236016 Kaliningrad, Russia

Abstract. Sustainable development of regions is a priority direction of state policy. The creation and development of industrial infrastructure within the region becomes one of the recent trends aimed at obtaining the highest results in indicators of sustainable development. The formation of industrial parks as drivers of economic growth contributes to the formation of an integral production system within the region aimed both at ensuring the economic security of the region and at accelerating its development. In order to assess the role of industrial parks in achieving sustainable development goals (SDG) at the regional level, the authors correlated the SDG and the contribution of industrial parks to their achievement. The authors proposed indicators of the impact of industrial parks on the sustainable development of the region based on a theory review of regional sustainable development and indicators of its assessment. Evaluation of development indicators of industrial parks in the Russian Federation made it possible to determine the trends of economic growth in the region with an increase in investment in industrial parks.

1 Introduction

The concept of sustainable development is becoming increasingly important for the Russian Federation. In 2015, the UN Agenda for Sustainable Development until 2030 was approved, in accordance with which the Russian Federation also embarked on the path of sustainable economic development. Within the framework of this research, we are more interested in the goals of economic growth and industrial production development: SDG No. 8 "Decent work and economic growth", SDG No. 9 "Industry, innovation and infrastructure", SDG No. 12 "Responsible consumption and production". Achievement of target No. 2 of SDG No. 9 "Promoting industrialization" is carried out through the creation of industrial parks (hereinafter - IP) as objects of territorial infrastructure. This becomes a highly important task in terms of industry contribution to Russia's GDP (about 25-30% of GDP).

An important part of federal policy is aimed at sustainable development of regions, the stimulation of industrial production in which is achieved, inter alia, by attracting investment in IP, creating jobs, as well as developing a circular economy as a promising direction towards achieving the SDGs.

*Corresponding author: nborodavkina@kantiana.ru

2 Materials and methods

The critical analysis of various sources including papers and statistic data made it possible to apply general scientific methods including a systems approach, logical, statistical and economic methods to provide the following results.

The research is based on the study of various approaches to the concept of "sustainable regional development". Most of the authors pay special attention to the ecological and economic aspects in determining the sustainable development of the region [1-5].

The formation of a sustainable economic model in the regions is influenced by the processes taking place in society, the main of which are the development of transnational corporations, dealerships, network business, production structure, trade, as well as the creation of clusters, technopolises, individual entrepreneurs, the spread of innovative types of services. These processes are able to change the traditional structure of the regional economy. Among the key aspects of the model of sustainable regional development, there are: an increase in the share of high-tech production, telecommunications, financial and consulting services, as well as socially oriented economic activity; environmental restructuring and modernization of production capacities of the basic sectors of the economy in order to reduce the resource intensity of production and increase its energy intensity through the introduction of alternative energy sources and energy-saving technologies; achieving a rational proportion structure of the state and market sectors; ensuring the priority of accumulation over consumption, and overcoming territorial disparities [6].

A system for assessing the sustainability of the region is built on the factors of the economic, social and ecological situation in the regions. Most researchers distinguish three groups of indicators (economic, social and environmental), which are then used to calculate the integral indices [7-8]. At the same time, the significant role of industrial parks in regional development predetermines the need to include indicators of IP activity in the methodology for assessing the sustainable development of a region. Therefore, the system of indicators for assessing the sustainable development of regions can be transformed and supplemented as shown in Table 1.

Table 1. Indicators of the impact of industrial parks on the sustainable development of the region (compiled by the authors using [8]).

Economic indicators	Social indicators	Environmental indicators
<div><ul style="list-style-type: none">- share of IP residents' investments in the regional infrastructure in the total volume of investments attracted to the region- share of IP residents' investments in production in the total volume of investments attracted to the region- share of tax revenues to the regional budget from IP residents in the total volume of tax revenues of the budget- workload of industrial infrastructure facilities in the IPs of the region- level of production localization in the region- innovative activity of organizations- turnover of innovative goods, works, and services- FDI share in the total volume of attracted investments in the region</div>	<div><ul style="list-style-type: none">- number of jobs created over the last year by IPs residents- indicator of business activity in the region</div>	<div><ul style="list-style-type: none">- productivity level of secondary raw materials- share of IP residents' investments in the ecology of the region in the total volume of their investments- share of payments by IPs residents for negative impact on the environment in the total amount of collected environmental payments in the region</div>

Thus, the assessment of sustainable development of the region in the traditional approach is based on the analysis and forecasting of economic, social and environmental factors, and from the standpoint of the industrial parks' influence on it - on the basis of the development of entrepreneurial activity, human capital, infrastructure and innovation.

3 Results and discussion

The concept of industrial parks is gaining more and more recognition all over the world, including the Russian Federation. Industrial parks became widely spread in Russia after the adoption of the Federal Law No. 116-FZ of July 22, 2005 "On Special Economic Zones in the Russian Federation". The Association of Industrial Parks of the Russian Federation started gathering IP statistics in 2013. Over the past 8 years, the total number of operating and emerging parks has increased 2.7 times.

Job creation and increased investment in production can be considered as the main advantages of industrial parks for the regional economy. So, over the past 8 years, approx. 185 thousand jobs were created at 3.5 thousand IPs resident enterprises, which may indirectly reflect the purpose of industrial parks in the context of regional economy development and the achievement of SDG No. 8.

It should be noted that investments volume in production located on the territory of industrial parks is more than 4 times higher than the volume of investments in infrastructure. This fact reinforces the importance of IPs not only as infrastructure facilities in the region, but also as a tool for the development of industrial production, which is one of the most important tasks for achieving SDG 9.

Industrial parks are becoming optimal platforms for the formation of industrial symbiosis as the basis for sustainable development of regions, which makes it possible to set up waste-free production, meaning an industrial chain, in which waste from one production becomes a resource for another.

The Moscow region, the Republic of Tatarstan, the Republic of Bashkortostan, the Leningrad and Kaluga regions are the leading regions in terms of the number of industrial parks (more than 10 industrial parks in the region). The location of the largest number of industrial parks in these regions is conditioned by the high population density, developed energy, transport and logistics infrastructure, large industrial facilities and qualified personnel.

The accumulated experience of industrial parks in Russia and foreign countries allows us to highlight the effects in achieving sustainable development goals, which are presented in Table 2.

Table 2. Contribution of industrial parks to the achievement of the SDG targets.

SDG targets	Industrial park contribution towards achieving SDG targets
SDG 8.1.	growth of industrial production in the region, which increases its GRP
SDG 8.2.	growth of labor productivity due to availability of complete infrastructure for industrial production in the IP
SDG 8.3.	increase in the number of jobs in the region; decrease in the unemployment rate in the region; stable employment in the most promising sector of the economy - industrial production
SDG 9.1.	infrastructure formation, including the road network, for the most efficient production process; equal access of all IP residents to the existing infrastructure
SDG 9.2.	growth in the level of employment in industry and the share of industrial production in GRP; formation of an integrated infrastructure for industrial enterprises
SDG 9.3.	providing small industrial enterprises with access to infrastructure facilities, significantly reducing their operating and transaction costs; integration of small businesses into value chains within industrial parks; the formation of a closed cycle economy within the park; industrial symbiosis
SDG 9.4.	the latest infrastructure for industrial production; long-term activity of industrial parks (more than 30 years); the use of environmentally friendly technologies, integrated environmental protection systems (eco-industrial parks)

Table 2. Continued.

SDG 9.5.	implementation of projects of new types of production in IPs, including innovative ones, scaling, increase in production volumes
SDG 12.3	possibility of exchanging waste (by-products) with other companies (inside the eco-industrial park and outside)
SDG 12.5	increase in the production turnover from secondary raw materials; reduction of payments for negative impact on the environment by reducing the volume of waste generation (transfer to other companies for disposal) and reduction of discharges and emissions from enterprises

The main indicators of the ecological, economic and social components of sustainable regional development are the ecological rating of regions (Consolidated Environmental Index), GRP per capita and the Human Development Index (HDI). In order to determine the role of industrial parks in achieving indicators of sustainable development of Russian regions, these indicators are presented in Table 3, where information is systematized by regions that are leaders in the number of industrial parks.

Table 3. Positions of regions of Russia being leaders in the number of industrial parks according to indicators of sustainable development.

Region	Federal district	The number of industrial parks (2020)	Consolidated Environmental Index (CEI) (winter 2020-2021)	GRP per capita, thousand rubles / person (2018)		HDI (2018)
				Region	Federal district	
RF	-	258	77/23 (max)	578.7 (average)		0.902
Moscow region	Central Federal district	40 (15.5%)	50/50	556.4	747.5	0.887
Republic of Tatarstan	Volga Federal District	23 (8.9%)	60/40	633.7	747.5	0.921
Republic of Bashkortostan	Volga Federal District	12 (4.7%)	59/41	412.5	747.5	0.874
Leningrad region	Northwestern Federal district	11 (4.3%)	56/44	603.2	645.7	0.870
Kaluga Region	Central Federal district	10 (3.9)	67/33	461.02	747.5	0.879
Kaliningrad Region	Northwestern Federal district	4 (1.5%)	51/49	461.6	645.7	0.878

For all the regions under consideration, Consolidated Environmental Index reaches over 50 points. This means fixing positive assessments of the ecological situation in the region for more than 50 indicators. The Tambov region demonstrated the highest CEI level in the Russian Federation in the winter of 2020-2021 - 77 positive ratings against 23 negative. The Kaluga region showed the leading results in the table (67/33), while the CEI level of other considered regions is close to the maximum.

According to the economic indicator of GRP per capita, the Republic of Tatarstan, the Leningrad and the Moscow regions stand out. Among the regions under consideration, only the Republic of Tatarstan and the Leningrad region exceed the average GRP per capita for the RF (578.7 thousand rubles/person for 2018), the rest of the regions also demonstrate a high level of regional production. The interesting fact worth mentioning is that the indicators of the regions are close to the ones for the corresponding federal district.

The highest HDI level was recorded in the Moscow Region and the Republic of Tatarstan, the latter exceeding the national indicator by 0.019 percentage points. The rest of the regions with rather high level of the Human Development Index are shown in table 3. In general, it should be noted that the regions with the largest number of industrial parks show the superior level of major indicators describing sustainable development.

Industrial parks function in all federal districts of the Russian Federation, including 66 regions. At the same time, an improvement in the indicators of regional sustainable development is observed not only where the bulk of industrial parks is concentrated, but also in regions where their number is still insignificant. So, only 2 private industrial parks have been created in the Kaliningrad region at the moment, and 2 state industrial parks are in the process of being launched. And even in this situation, an increase in investment in industrial parks of the region can be considered as a growth factor of the GRP per capita, the Consolidated Environmental Index and the Human Development index (Fig. 1).

Fig. 1. Dynamics of sustainable development indicators in the Kaliningrad region (compiled by authors).

The dynamics of sustainable development indicators of the region substantiates the successful infrastructural development of the region and an increase in its competitiveness.

4 Conclusions

1. A review of theoretical approaches showed that sustainable development of regions is determined by economic, social and environmental factors. The formation of industrial parks contributes not only to the economic growth of the region, but also to its social development, as well as to the solution of environmental problems.
2. The assessment indicators system for the sustainable development of the region can be enforced with indicators of the impact of industrial parks in the context of three projections: economic, social and environmental development of the region.
3. The research made it possible to determine the contribution of industrial parks to the achievement of sustainable development goals and their objectives. In achieving SDG No.8 targets, industrial parks contribute to the growth of industrial production by creating the necessary infrastructure, increasing labor productivity, increasing the number of jobs in the region and increasing employment. When it comes to achieving the targets of SDG No. 9, a complex infrastructure is created on the territory of the industrial park, providing development opportunities for both large business and medium and small industrial enterprises. An industrial symbiosis becomes a way of implementing the principles of a closed-cycle economy in specialized industrial parks. Eco-industrial parks play a special role in achieving targets of SDG No.12, which provide an opportunity for the internal

exchange of production waste, as well as their most rational use and disposal within the same territory.

References

1. A. P. Kuznetsov, R. Yu. Selimenkov, *Sustainable development of the region: environmental and economic aspects* (ISERT RAN, 2015)
2. D. V. Shimanovsky, E. A. Tretyakova, Perm Univ. Herald. ECON, **15/3**, 369 (2020)
3. O. Voronkova, V. Yankovskaya, I. Kovaleva, I. Iusupova, Y. Berdova, ESI, **7(1)**, 662 (2019)
4. T. Tolstykh, L. Gamidullaeva, N. Shmeleva, M. Woźniak, S. Vasin, JOItmC., **7(1)**, **5**, 1 (2021)
5. S. P. Zemtsov, V. A. Barinova, V. M. Kidyaeva, T. A. Lanshina, Economic policy, **2**, 18 (2020)
6. L. Simkiv, S. Shults, O. Lutskev, U. Andrusiv, Eur. J. Sustain. Dev., **10(1)**, 153 (2021)
7. L. N. Orlova, Bulletin of the Plekhanov Russian University of Economics, **2(98)**, 161 (2018)
8. E. A. Tretyakova, M. Y. Osipova, Stud. Russ. Econ. Dev., **29**, 124 (2018)